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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,013	10/16/2003	Muqtada Husain	10541-1870	7444

7590 08/16/2004

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EXAMINER

LUM VANNUCCI, LEE SIN YEE

ART UNIT	PAPER NUMBER
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3611

DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

6

Office Action Summary

Application No.

10/687,013

Applicant(s)

HUSAIN ET AL.

Examiner

Lee Lum

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The disclosure is objected to because the following elements lack antecedent basis:
in Claim 3 – torque,
in Claims 5, 13, 15, 20, 25 – angle,
in Claims 16, 21, 26 - rate of change.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4-6, 8 and 10-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The following Claims recite functions unsupported by structure:

Claim 4 – sensing an end-of-travel position,
Claims 5, 14 and 15 – sensing the angle of the road wheel,
Claims 6 and 16 – sensing the rate of change of the road wheel angle,
Claim 8 – sensing the current draw of the second motor,
Claim 10 – sensing angle of the steering wheel,
Claim 11 – sensing the rate of change of steering wheel angle,
Claim 12 – sensing the torque applied to the steering wheel,
Claim 13 – sensing a road wheel obstruction.

Amendment is required.

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3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 7, 9, 10, 12, 17, 22, 24, 25 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Menjak et al 6598695.

Re Claims 1, 4, 7, 9, 10 and 12, Menjak discloses a system for providing an end-of-travel feedback from a road wheel to a driver of a vehicle, the vehicle including a steer-by-wire system 10, the system comprising

Steering mechanism including steering wheel 14 and shaft 16,

First motor 66 coupled to the steering shaft to provide roadfeel resistance to the driver,

Brake 56 coupled to shaft 58 of the first motor to provide mechanical resistance when the road wheel is in an end-of-travel condition (via maximum angles of rotation of the steering wheel; col 3, lines 25-26, lines 33-35, and col 4, lines 56-60),

Controller 36 including the determination of an end-of-travel position (via sensors 32), as best understood), and

Engaging the brake when the position is reached (col 5, lines 32-34), or,

Disengaging the brake when the road wheel is away from the end-of-travel position (inherent), or,

Disengaging the brake is determined on the angle of the steering wheel via sensors 32 (col 3, lines 1-2), or the torque applied to the steering wheel via sensor 60, and,

Second motor 26 controlling an angle of the road wheel.

Re Claims 17, 22, 24 25, and 27, the reference further discloses a method for providing an end-of-travel feedback from a road wheel to the driver, the steps derived from the structure and means discussed above.

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. **Claims 2 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Menjak in view of Hefner et al 6389343.

Menjak does not disclose the brake as a friction brake, while Hefner shows this type in col 2, line 55). It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this type of brake, as shown in Hefner, as an alternate, but functionally-equivalent, means to provide resistance to the end-of-travel position.

B. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Menjak in view of Andonian et al 6557662.

Menjak does not disclose engagement of the brake as dependent on the road wheel angle, while Andonian shows this feature in col 2, line 49. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this arrangement, as shown in Andonian, to increase the accuracy and performance of the steer-by-wire system, thus increase the safety and comfort of the driver in the steer-by-wire system.

C. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Menjak in view of Nakano et al 6523637.

Menjak does not disclose the brake as engaged based on the rate of change of the road wheel angle, while Nakano shows this feature via sensor 7; "yaw rate sensor". It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this arrangement, as shown in Nakano, to increase the accuracy and performance of the steer-by-wire system, thus increase the safety and comfort of the driver in the steer-by-wire system.

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D. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Menjak in view of Miller 6422335.

Menjak does not disclose the brake as engaged based on the current draw of the road wheel motors, while Miller shows this arrangement via sensor 210. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this arrangement, as shown in Miller, to increase the accuracy and performance of the steer-by-wire system, thus increase the safety and comfort of the driver in the steer-by-wire system.

E. **Claims 11, 13 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Menjak in view of Borsting et al 6484838.

Re Claims 11 and 26, Menjak does not disclose the disengagement of the brake based on the angular acceleration of the steering wheel, while Borsting shows this configuration in col 5, last paragraph, to col 6, line 2. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this feature, as shown in Borsting, to increase the accuracy and performance of the steer-by-wire system, thus increase the safety and comfort of the driver in the steer-by-wire system.

Re Claim 13, Menjak does not disclose the capability of the controller to sense when the angle of the road wheel is restricted due to the wheel encountering an object. Borsting shows this feature in col 5, lines 21-28. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this arrangement, as shown in Borsting, to increase the accuracy and performance of the steer-by-wire system, thus increase the safety and comfort of the driver in the steer-by-wire system.

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F. **Claims 14 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Menjak in view of Borsting, and in further view of Miller.

The previous references do not disclose the brake as engaged based on the current draw of the road wheel actuator, while Miller shows this additional sensor 210. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this arrangement, as shown in Miller, to increase the accuracy and performance of the steer-by-wire system, thus increase the safety and comfort of the driver in the steer-by-wire system.

G. **Claims 15 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Menjak in view of Borsting, and in further view of Andonian.

The previous references do not disclose the brake as engaged based on the road wheel angle, while Andonian shows this feature in col 2, line 49. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this arrangement, as shown in Andonian, to increase the accuracy and performance of the steer-by-wire system, thus increase the safety and comfort of the driver in the steer-by-wire system.

H. **Claims 16 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Menjak in view of Borsting, and in further view of Nakano.

The previous references do not disclose the brake as engaged based on the road wheel yaw rate, while Nakano shows sensor 7. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this arrangement, as shown in Nakano, to increase the accuracy and performance of the steer-by-wire system, thus increase the safety and comfort of the driver in the steer-by-wire system.

5. **Claims 3 and 18** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Prior art does not disclose the system recited above further comprising a torque transfer mechanism that multiplies the torque between the steering shaft and first motor shaft.

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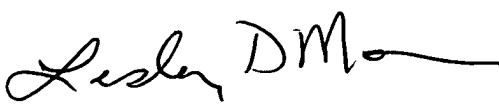
6. The prior art made of record, and not relied upon, is considered pertinent to the disclosure: Uenuma et al 6751539, Yao et al 6728615, Hjelsand et al 6575263, Dilger et al 6219604, Bohner et al 5896942.

7. Communication with USPTO/Examiner

Any inquiry concerning this communication, or others, should be directed to Ms. Lum at 703 305-0232, M-F, 9-6. If attempts to reach the examiner are unsuccessful, her supervisor, Ms. Lesley Morris is at 703 308-0629. Our fax number is 703 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for unpublished applications: private PAIR only, for published applications: private or public PAIR. For more information re PAIR: <http://pair-direct.uspto.gov>. Questions re private PAIR: contact the Electronic Business Center (EBC) at 866 217-9197.

Ms. Lee S. Lum
Examiner
8/2/04

Handwritten signature of Ms. Lee S. Lum, consisting of stylized initials 'LSL' followed by a checkmark.Handwritten signature of Lesley D. Morris, appearing as 'Lesley DM' with a long horizontal flourish.

LESLEY D. MORRIS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600